

WHAT IS CLAIMED IS:

1. A navigation system, comprising:
 - a map data memory for storing map data;
 - an input unit including a route guide module, in which a user inputs information and/or designates a travelling path, whereby the route guide module provides information on a route from an entrance road of a car to an exit road from an intersection;
 - a GPS receiver including a positioning module for detecting a present position of the car on the basis of position information provided from at least one GPS satellite;
 - a Gyro sensor for detecting a rotation angle of the car;
 - a controller, which uses the map data from the map data memory, route information from the input unit, information from the GPS receiver about the present position of the car, and route information from the Gyro sensor, for generating the configuration of an intersection the user is supposed to enter and an arrow indicating a driving route to the user, and for displaying a progression rate of the car along the route; and
 - a display driving unit for displaying the configuration of the intersection and the arrow for route guidance on the basis of output data from the controller, and for performing a graphic operation on the configuration, whereby a gradual progression rate of the car is indicated in the directional arrow.

2. The navigation system according to claim 1, wherein the map data includes a plurality of nodes and links and configuration points, namely latitude/longitude coordinates, composing the complicated intersection.

3. The navigation system according to claim 1, wherein an entrance link of the car in the intersection, the entrance link being extracted from the map data memory, is headed up.

4. The navigation system according to claim 3, wherein when the entrance link of the car in the intersection is headed up, calculations of relative angles between a travelling direction of the car and other roads connected to the intersection are derived from a table of trigonometric function.

5. The navigation system according to claim 1, wherein as for indicating the progression rate of the car in the intersection, the arrow for route guidance is gradually filled or emptied.

6. The navigation system according to claim 1, wherein the travelling route for the car is expressed by links connecting nodes.

7. The navigation system according to claim 1, wherein a head of the arrow points at a start node of the exit link getting out of the complicated intersection, thereby indicating

from which direction the user comes and for which direction the user is heading.

8. An operating method of a navigation system, comprising the steps of:
obtaining information about a complicated intersection;
calculating heading up and screen coordinates;
displaying the complicated intersection based on the screen coordinates being converted;
displaying a route that passes through the complicated intersection; and
gradually changing the colour of the route to be correspondent to a present position of the car, thereby indicating a present position of the car on the route.

9. The method according to claim 8, wherein to obtain the configuration of the complicated intersection based on information about the complicated intersection, nodes, links, and latitude/longitude coordinates of the intersection being ahead, and the true north direction are obtained from a map data memory of the navigation system.

10. The method according to claim 8, wherein calculating heading up and screen coordinates is performed on the basis of information input to a controller of the navigation system and the heading up is performed by rotation with centering around a connection node of an entrance link, and the screen coordinates is performed by converting absolute latitude/longitude coordinates to the screen coordinates of the car.

11. An operating method of a navigation system, comprising the steps of:
constructing a map database including a complicated intersection composed of at least one intersection;
displaying a driving route in the intersection, applying a Turn-By-Turn method;
using information provided by a map data memory and GPS receiver and obtaining whether an entrance road is part of a complicated intersection;
if the entrance road is part of a complicated intersection, extracting the configuration of the corresponding complicated intersection from the map data memory, and displaying the configuration;
displaying a travelling direction of a car in the intersection; and
gradually changing an arrow displayed on the travelling direction of the car while keeping pace with a present position of the car provided from a positioning module of a GPS receiver.

12. The method according to claim 11, wherein to display the travelling direction in the intersection, node information stored in a map data memory is extracted and a true north direction value of the entrance road is calculated to perform heading up and to convert latitude/longitude coordinates stored in a database to screen coordinates.

13. The method according to claim 11, wherein to indicate a progression rate of the car
to be correspondent to the present position of the car in the complicated intersection, a controller controls a graphic interface of the navigation system to gradually change the colour of an arrow on the travelling route, based on position information of the car provided by a positioning module of the navigation system.

14. The method according to claim 11, wherein a progression rate of the car is indicated not only for complicated intersections but also for general intersections.